up the bar movement and also because of a possibility of omitting a looper, the production line length can be made shorter. Moreover, because of a special mechanism that overlaps the omit portions of the bars, waste material to be thrown away after bonding can be reduced.

WHAT IS CLAIMED IS:

1. A method of bonding metal plates comprising steps of:

applying a shearing blade of specific shape onto both sides of overlapped metal plates and then, while shearing the metal plates by moving the shearing blades so as to sandwich the overlapped portion; and

forming a bonded portion by making use of the deformation of each sheared surface to be generated during the shearing process;

wherein the bonded portion or bonded surface is formed in an oblique direction inclined with respect to the thickness direction of the metal plates.

2. A method of bonding metal plates according to Claim 1; wherein the inclination angle of the bonded portion or bonded surface is 75° or less.

3. A method of bonding metal plates comprising steps of:

applying a shearing blade of specific shape onto opposed positions of both sides of overlapped metal plates and then, while shearing the metal plates by moving the shearing blades so as to sandwich the overlapped portion; and

forming a bonded portion by making use of the deformation of each sheared surface generated during the shearing process;

wherein an operating locus of each of the shearing blade edges is so set that a pressing force pressing the sheared surfaces onto each other is generated.

4. A method of bonding metal plates according to Claim 3; wherein the operating locus is so set that an extension line of each locus overlaps the inner side of the opposed shearing blade or crosses each other.

5. A method of bonding metal plates according to Claim 4;

wherein at least either one of the operating loci is so set as to be inclined with respect to the thickness direction of the metal plates.

6. A method of bonding metal plates according to Claim 5;

wherein, provided that an extension line of the operating locus overlaps the shearing blade, the overlap is 0.1 mm to 15 mm if the metal plates are

steel material.

7. A method of bonding metal plates according to any one of Claims 3 to 6;

wherein the stroke of the shearing blade is 50% to 150% of the thickness of the metal plate.

8. A method of bonding metal plates comprising steps of:

applying a shearing blade of specific shape onto at least either one of both sides of overlapped metal plates and then, while shearing the metal plates by moving the shearing blades so as to sandwich the overlapped portion, forming a bonded portion by making use of the deformation of each sheared surface generated during the shearing process; wherein

a protrusion provided on the shearing blade bites into the metal plates so that a pressing force pressing the sheared surfaces onto each other is generated as the shearing blades move.

9. A method of bonding metal plates according to Claim 8; wherein

a shearing blade equipped with the protrusion is applied onto opposed positions of both sides of the metal plates, and a method of bonding metal plates according to any one of Claims 3 to 7 is employed.

10. A method of bonding metal plates according to

any one of Claims 3 to 9; wherein

a clamping force is applied, corresponding to the pressing force generated, so as to sandwich the overlapped portion.

11. An apparatus for bonding metal plates which forms a bonded portion by making use of the deformation of each sheared surface to be generated during shearing process; wherein there are provided

shearing blades arranged opposite on both sides so as to sandwich the overlapped portion of the metal plates, and a moving mechanism which moves the shearing blades relatively so that the overlapped portion is sandwiched and the bonded portion is formed oblique.

12. An apparatus for bonding metal plates according to Claim 11; wherein

the moving mechanism is so constructed as to move the shearing blades relatively in a moving direction that each shearing blade overlaps the inner side of the opposed shearing blade or so that an extension line of the moving direction crosses each other.

13. An apparatus for bonding metal plates according to Claim 11 or 12;

wherein there is provided a protrusion, which bites into the metal plate during the shearing process,

on at least either one of the shearing blades, at a portion to be in contact with the metal plates.

14. An apparatus for bonding metal plates according to Claim 13; wherein

the protrusion is formed in a triangle-columnar shape having an apex in the thickness direction and a width in the width direction of the metal plates.

15. An apparatus for bonding metal plates according to Claim 14; wherein

the surface of the protrusion opposed to the sheared surface is so formed that the protrusion angle (θ) with respect to the horizontal surface of the metal plate is 30° or more and, at the same time, less than the angle between a line parallel to the moving direction of the shearing blade and the above horizontal surface.

16. An apparatus for bonding metal plates according to any one of Claims 11 to 15; wherein

there is provided a clamp which applies a pressure so as to sandwich the overlapped portion.

17. A hot strip mill including a bonding apparatus for bonding a preceding bar and a following bar in motion between a coarse rolling mill and a finish rolling mill for rolling hot rolled strips;

wherein said bonding apparatus comprising an

overlapping mechanism which overlaps the portions to be bonded of the preceding bar and the following bar each other; a bonding mechanism equipped with upper and lower shearing blades which, while pressing and shearing the bars from above and from below, bond the two overlapped bars; and a shearing blade drive mechanism which applies a pressing force onto the shearing blades.

18. A hot strip mill according to Claim 17; wherein the shearing blade has an edge angle (θx) so that the operating locus is inclined with respect to the thickness direction of the bar; and there is provided, on the top surface of the shearing blade, a protrusion which bites into the bar when the blade is pressed.

19. A hot strip mill according to Claim 17 or 18; wherein the shearing blade drive mechanism is so constructed as to perform a cyclic operation by causing the upper and lower shearing blades to stand by at a specified stand-by position, starting pressing the shearing blades when the overlapped portion of the two bars has reached the bonding mechanism, and then returning the shearing blade back to the stand-by position when the shearing blades have completed a pressing stroke up to the completion of bonding; and a

synchronous operation by moving the shearing blades so as to follow the bar movement while the shearing blades are in contact with the bars.

20. A hot strip mill according to Claim 17, 18, or 19; wherein the overlapping mechanism is so constructed as to increase the following bar speed and overlap the two bars when the trailing end of the preceding bar has reached a specified position, and return the bar speed to an original one when the overlapped portion has reached a specified length.

21. A hot strip mill according to Claim 20;

wherein the overlapped portion includes an "omit" portion of at least either one of the preceding bar or the following bar.

22. A hot strip mill according to Claim 20;

wherein a portion of the preceding bar and that of the following bar, which are to be overlapped each other, are descaled in a process prior to the overlapping portion.

23. A hot strip mill according to Claim 22;

wherein overlapping is completed within 20 seconds after the aforementioned descaling.